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the cornea feels the pressure within, and starts out; the marsupium stands erect, swelling and bristling all over, and the lens leaps forward, while the iris flaunts the flag of battle. Guided by such an instrument as this, the bird comes down with unerring aim upon his quarry; he seizes it in his talons; and now, become near sighted, well can he see to perform the bloody work before him.

There is, perhaps, as much to be seen in a view of a bird's eye, as ever lies within the bounds of a "bird's-eye view."

HABITS OF THE BURROWING OWL OF CALIFORNIA.

BY DR. C. S. CANFIELD.*

I WISH to state a few facts about the Burrowing Owl (*Athene cunicularia* Molina) that lives in California. I had almost constantly for four years opportunities of observing the habits of this little owl, which is really one of the most notable features in the natural history of California. A colony of these owls lived within one hundred yards of my cabin while I passed a frontier life; and they were very common everywhere in that vicinity. I have seen them every day for years, hundreds and perhaps thousands of them in all. Where I have seen them, they always live in the deserted or unoccupied burrows of the Ground Squirrel (*Spermophilus Beecheyi*). I came to the conclusion that they were able to drive out the Spermophiles from their habitations, but I am not certain of the fact. It is true that there were, in that region, always a large number of unoccupied burrows wherever there was a colony of Spermophiles; so that there was no lack of unoccupied habitations for the owls to take possession of. But I have noticed that wherever there was a large number of the owls, very few or no Sper-

*Communicated in a letter to the Smithsonian Institution, and forwarded by the Secretary for publication.

mophiles lived. *One or two* owls would occasionally be seen among a colony of Spermophiles, but they never appeared to live in the same hole or burrow with the squirrel; and I have never seen a squirrel enter a burrow that was occupied by owls, however much tempted by fear he might be to enter the first hole he should come to. True, the Spermophile never likes to enter any burrow but his own, and will run past any number of inviting entrances in order that he may at last hide himself in his own domicile. But aside from this, I believe that the squirrels are afraid of the owls, and do not dare to intrude upon them. The notion that the *Athene* digs its own burrow appears to me apocryphal and unreasonable. I have never seen any evidence of it. Negative evidence proves nothing; but yet the absence of facts is strong presumption against their existence, and it would be strange that I should never have seen any evidences of their digging powers if they have any. After a shower of rain, one sees fresh earth thrown out around the mouths of the burrows of the Spermophiles, but never anything of the kind around the burrows of the owls. They are not constituted for digging, and there is no necessity for it; they can always find any number of holes ready-made for them. That they live in peace and amity with the rattlesnake, I believe to be another error and stretch of the imagination. Rattlesnakes are very abundant where I lived, and I killed one or two almost every time that I rode a mile or more from the house, yet I never saw a rattlesnake near a squirrel's hole but once, and that hole was a deserted one. I once found a large rattlesnake swallowing a squirrel (*Spermophilus Beecheyi*) that it had caught, in the centre of a colony of squirrels, but several yards distant from any "squirrel-hole."

I once took pains to dig out a nest of the *Athene cunicularia*. I found that the burrow was about four feet long, and the nest was only about two feet from the surface of the ground. The nest was made in a cavity in the ground, of about a foot in diameter, well filled in with dry soft horse-

dung, bits of an old blanket, and fur of a Coyoté (*Canis latrans*) that I had killed a few days before. One of the parent birds (male or female?) was in the nest, and I captured it. It had no intention of leaving the nest, even when entirely uncovered by the shovel, and exposed to the open air. It fought bravely with beak and claws. I found seven young ones, perhaps eight or ten days old, well covered with down, but without any feathers. The whole nest, as well as the birds (old and young), swarmed with fleas. It was the filthiest nest that I ever saw. In the passage leading to the nest there were small scraps of dead animals; such as pieces of the skin of the antelope, half dried and half putrified, the skin of the coyoté, etc.; and near the nest were the remains of a snake that I had killed two days before, a large *Coluber?* two feet long. The birds had begun at the snake's head, and had picked off the flesh clean from the vertebræ and ribs for about one-half of its length; the other half of the snake was entire. The material on which the young birds nested was at least three inches in depth. I do not remember the time of the year.

The Burrowing Owls do not migrate. Where I lived they were as numerous in winter as in summer. Perhaps in low, flat plains, that are deluged or inundated by water in the winter, the little owl is obliged to have a far drier location, but I have never seen any such migration. They always remain in or near their burrows through the day, never leaving them to go any distance except when disturbed, when they make a short crooked flight to some other hole near by, and when driven from this last one return to the first again. When the sun sets they sally forth to hunt for food, etc., and are all night on the wing. I had seen them and heard them at all times of the night and early in the morning. They are not strictly nocturnal, for they do not remain in their nests or burrows all day, but their habits, in this respect, are about the same as those of the other owls, as *Strix pratincola*, *Nyctea nivea*, etc., or of the domestic cat.

There are very few birds that carry more rubbish into the nest than the *Athene*; and even the Vultures are not much more 'filthy.' I am satisfied that the *Athene canicularia* lays a larger number of eggs than is attributed to it in Dr. Brewer's work. I have frequently seen, late in the season, six, seven or eight, young birds standing around the mouth of a burrow, isolated from others in such a manner that I could not suppose that they belonged to two or more families.

A CHAPTER ON FLIES.

BY A. S. PACKARD, JR.

THE subject of flies becomes of vast moment to a Pharaoh, whose ears are dinned with the buzz of myriad winged plagues, mingled with angry cries from malcontent and fly-pestered subjects; or to the summer traveller in northern lands, where they oppose a stronger barrier to his explorations than the loftiest mountains or the broadest streams; or to the African pioneer, whose cattle, his main dependence, are stung to death by the Tsetze fly; or the farmer whose eyes on the evening of a warm spring day, after a placid contemplation of his growing acres of wheat-blades, suddenly detects in dismay clouds of the Wheat-midge and Hessian-fly hovering over their swaying tops. The subject, indeed, has in such cases, a national importance, and a few words regarding the main points in the habits of flies—how they grow, how they do not grow (after assuming the winged state), and how they bite; for who has not endured the smart and sting of these dipterous Shylocks, that almost torment us out of our existence while taking their drop of our heart's blood—may be welcome to the readers of the NATURALIST.

The Mosquito will be our first choice. As she leaps off